Science and Technology Facilities Council

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The UKSRC support for cosmology community

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On behalf of the UKSRC

UKSRC Research Scientist
The University of Manchester

SKA Science Meeting, Gorlitz, Jun 2025

The SRCNet

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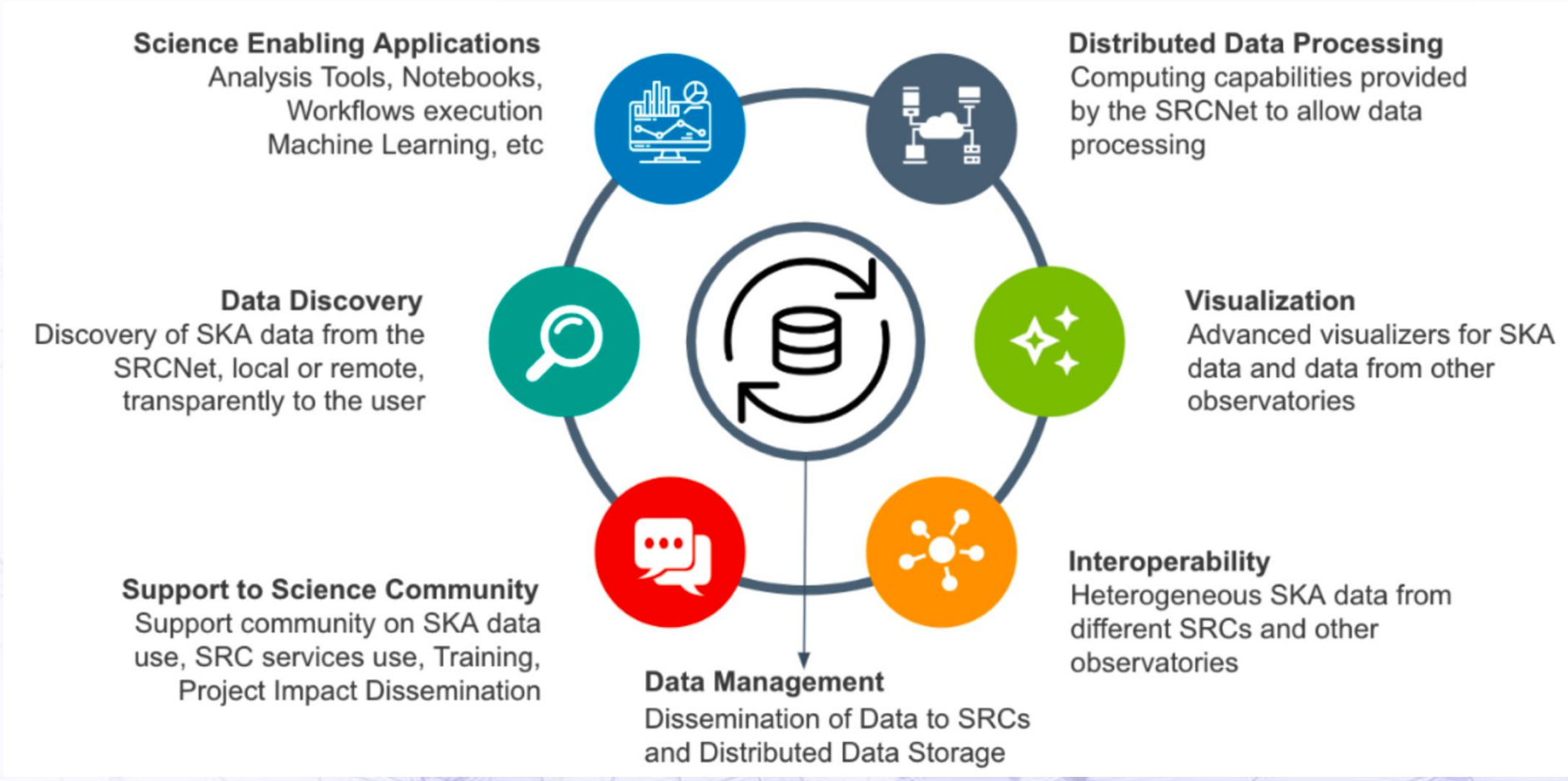
The SKA Regional Centre Network (SRCNet) will provide a portal to access SKA data



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The UK SKA Regional Centre

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UK SRC infrastructure and services:

Supporting and facilitating UK science

Global SRC Network:

Developing and delivering the global SRCNet.

UK SKA Regional Centre

UNIVERSITY OF CAMBRIDGE

THE UNIVERSITY of EDINBURGH

Durham University

University of Hertfordshire UH

MANCHESTER 1824 The University of Manchester

UCL

UKRI Science and Technology Facilities Council | Scientific Computing

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Alignment with SKA science goals

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Credit: SKA Observatory website (https://www.skao.int/en/explore/science-goals)

Demonstrator case

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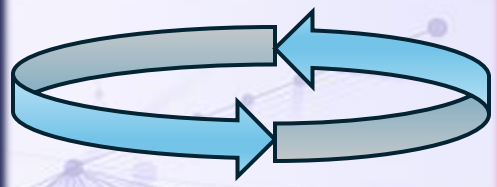
Goals: Co-design and co-develop the UKSRC node with the community

Approach: Demonstrator cases

- **Identify priorities**: open calls , community townhall, engagement workshops
- **Onboard** to UKSRC resources
- UKSRC **support**
- User **feedbacks**

Users receive

- Compute resources
- Workflows within UKSRC architecture
- Science/development/tech support from UKSRC
- Participate in the future direction and features in UKSRC/SRCNet
- New science using UKSRC resources



Community co-creating

UKSRC Receive

- Incorporate new workflows
- Ability to stress-test system with new workflows
- Inform development of UKSRC architecture & development
- Develop science support models

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Demonstrator case

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Progress: 4 cases finished, 3 cases in progress, 10 under selection

Phase 1

- Processing and delivery of LOFAR2.0 international station data. (LOFAR)
- Late-time 21cm intensity mapping in autocorrelation mode. (MeerKAT)
- Multi-wavelength datasets for radio continuum and HI surveys. (LOFAR, MeerKAT, Rubin Obs., DESI Legacy Survey, VISTA, WISE)
- SKA-EoR analysis demonstrator. (HERA, LOFAR)

Phase 2

- Discovering Pulsars and Fast Transients through Candidate Identification, Classification and Machine Learning. (LOFAR, MeerKAT, other transient facilities)
- Incoherent Radio Transients. (ASKAP, e-MERLIN, JVLA, LOFAR, MeerKAT)
- Planet-Earth Building Blocks. (ALMA, e-MERLIN, Gaia)

Phase 3

- 10 applications under selection, 4 cosmology-related

Demonstrator case

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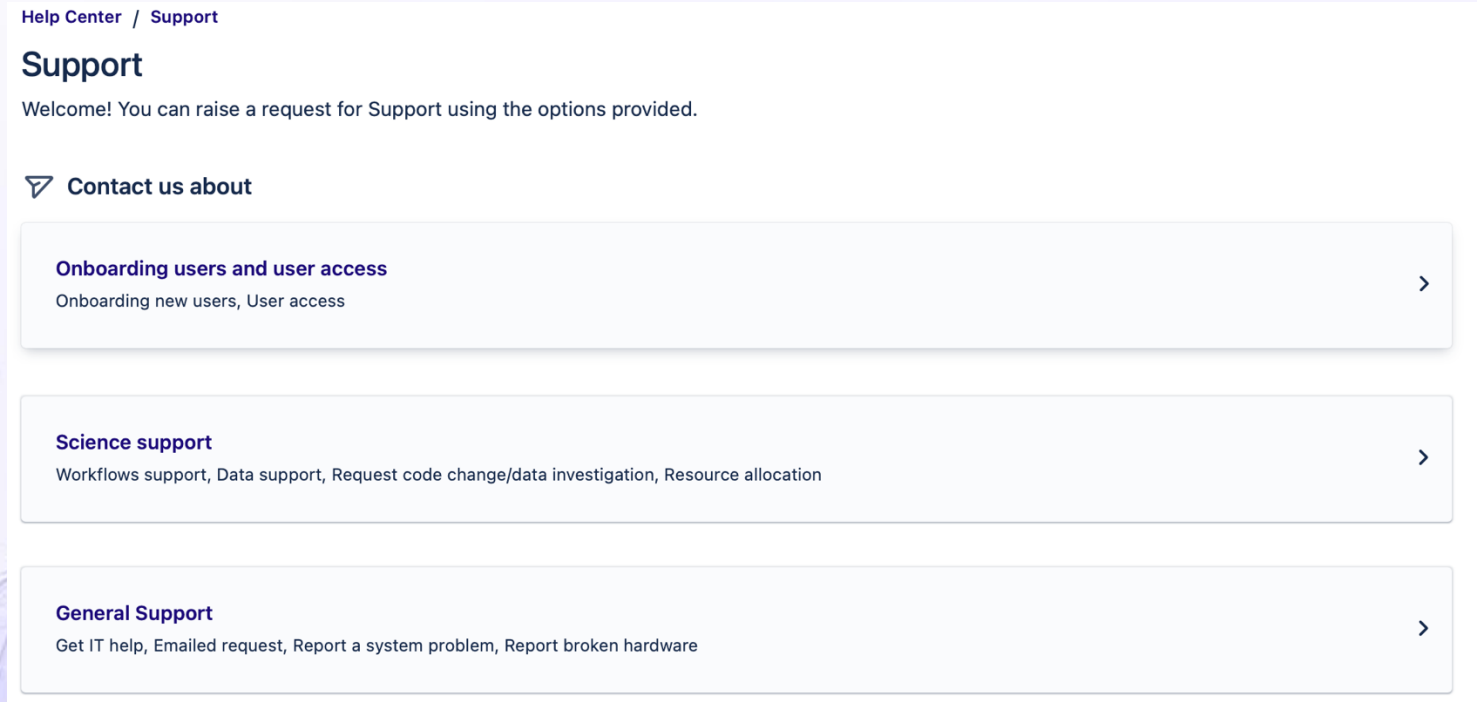
Helpdesk system: science/technical queries

Support email: uksrc-support@manchester.ac.uk

Review: Quarterly progress meetings

Monitoring:

- Compute/storage use
- Training/development needs
- User feedbacks



Science validation framework

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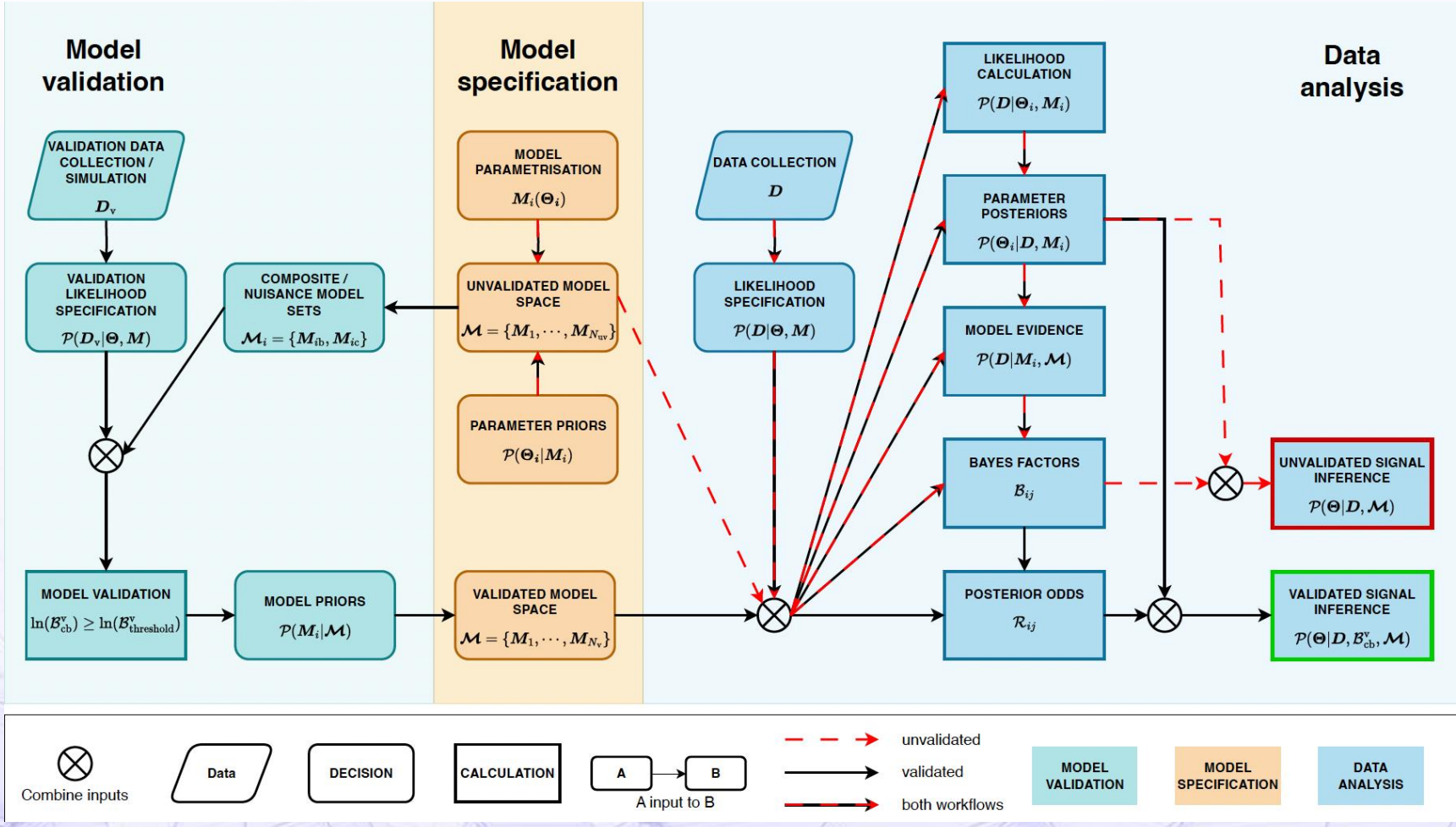
Why:

- Precision cosmology/astrophysics for SKA/precursor
- Maintain scientific integrity
- Inform instrument specifications
- Iterative model refinement

Objectives:

- End-to-end precision simulations (Sky + Instrument)
- Bayesian model validation toolkit



Credit: Sims+25 (arXiv:2502.14029)

Science validation framework

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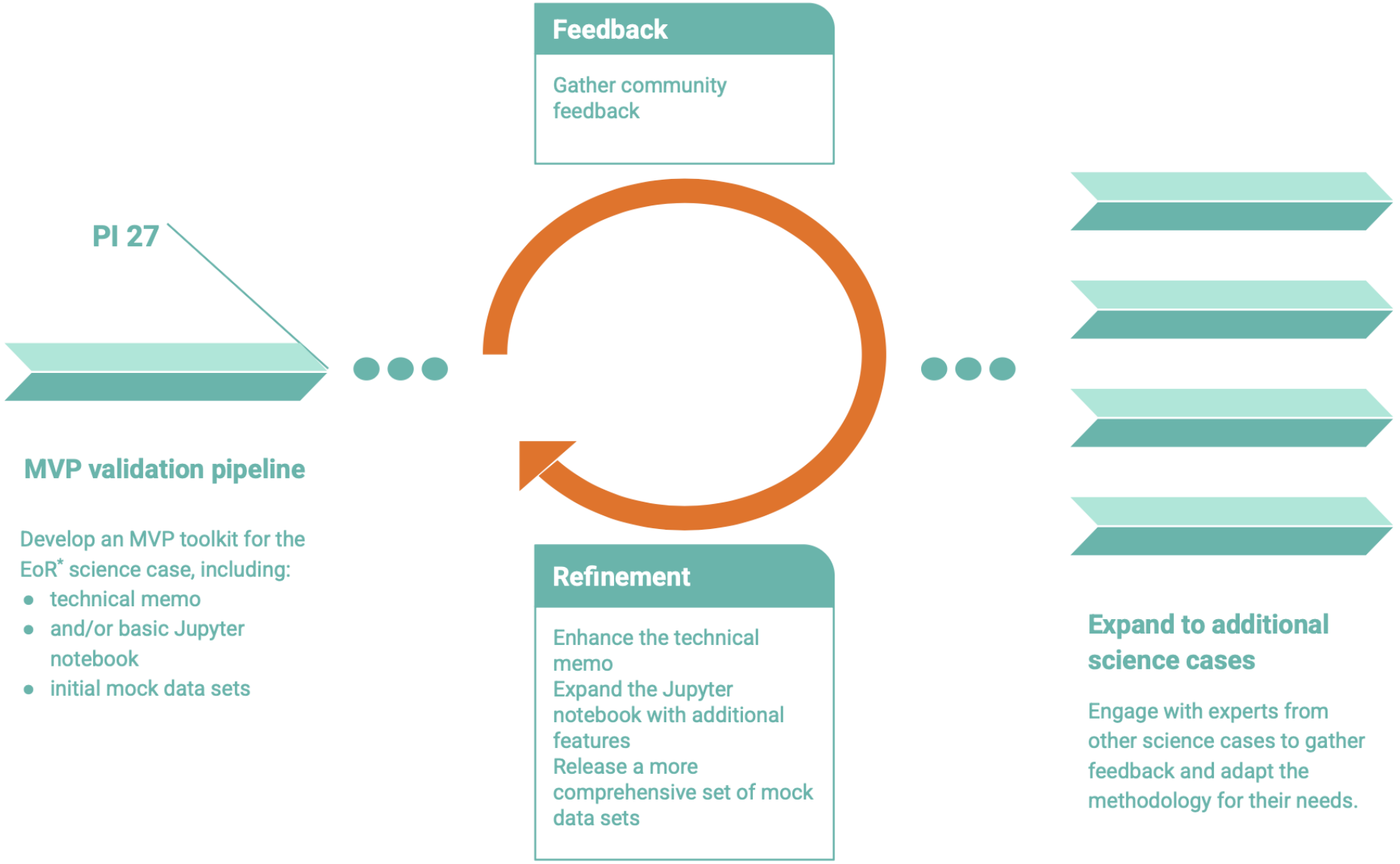

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Summary

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- Demonstrator cases build future SRC capabilities
- Validation toolkit for the integrity of SKA science
- Know-how user support system
- Co-development is at the heart of UKSRC's strategy
- Feedback loop essential for infrastructure design and development
- Support innovation and community readiness

Support email: uksrc-support@manchester.ac.uk